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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXIII Number 20

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IN THIS ISSUE

The discovery of typical symptoms of yellow-red virosis (X disease) on chokecherry in northern Illinois is reported by H. F. Seifert and H. W. Anderson, page 328.

P. A. Ark reports an occurrence of bacterial wilt on corn in California, page 328.

William G. Hoyman sends the first report of *Colletotrichum trifolii* on alfalfa in New Mexico, page 328.

Results of the 1939 cotton boll rot survey are tabulated and discussed by Paul R. Miller and Richard Weindling, page 329.

P. W. Miller contributes a report on the incidence of diseases of nut crops in the Pacific Northwest in 1939, page 334.

Diplodia stalk rot caused much premature dying in experimental corn fields in Illinois, and bacterial wilt was more prevalent than in 1938, according Benjamin Koehler, page 337.

SOME RECORDS OF FIRST APPEARANCE OR UNUSUAL OCCURRENCE

YELLOW-RED VIROSIS ON CHOKECHERRY IN ILLINOIS: Specimens of chokecherry collected by State nursery inspectors and the pathologist of the State Department of Agriculture in early October showed typical symptoms of the yellow-red virosis (X-disease of peach). These symptoms consisted in a bright red color of the foliage and in several cases typical rosetting of the terminals. Neighboring shrubs of the chokecherry showed no evidence of autumnal colors which might be confused with these symptoms. The diseased shrubs were in general in good types of soil and were not suffering from drought or starvation. The symptoms in all cases were identical with those seen in New York by one of us (H. W. Anderson) in late July.

This preliminary survey was made in the northern tier of counties. Fortunately, the chokecherry is considered to be of rare occurrence in southern Illinois, where the peach industry is of commercial importance. (H. F. Seifert, Illinois State Department of Agriculture, and H. W. Anderson, University of Illinois).

STEWART'S WILT DISEASE OF CORN IN CALIFORNIA: The Stewart's disease of corn was found recently in specimens of Golden Bantam plants shipped from the southern part of the State. The plants showed typical symptoms of the disease. The organism isolated from lesions produced the typical disease in corn seedlings in the greenhouse and bacteriologically tested showed unmistakable correspondence with Phytomonas [Aplanobacter] stewarti. From the letter accompanying the specimens it was evident that the disease was present on corn in this locality last year. The infection apparently was due to contaminated seed, for there was no spread to another field of corn (variety Alameda), adjoining the diseased field. (P. A. Ark, Division of Plant Pathology, University of California).

FIRST REPORT OF COLLETOTRICHUM TRIFOLII ON ALFALFA IN NEW MEXICO: The observation of several alfalfa fields in the vicinity of State College, New Mexico, during the fore part of October revealed the presence of Uromyces striatus, Peronospora trifoliorum, Pseudopeziza medicaginis, Phymatotrichum omnivorum, and Ascochyta imperfecta. All but the two last-named pathogens were quite abundant throughout the territory surveyed.

Of the several alfalfa fields examined, 2 adjoining fields were found in which many plants had completely wilted. Wilted plants were not confined to particular areas but scattered throughout the fields. An examination of these wilted plants as well as other plants disclosed lesions on the lower portion of the stems. The pathogen was identified as Colletotrichum trifolii. According to Prof. R. F. Crawford, Head of the Biology Department, this is the first report of Colletotrichum trifolii on alfalfa in New Mexico. (William G. Hoyman, New Mexico State College).

A SURVEY OF COTTON BOLL ROT DISEASES IN 1939 AND THE MICROORGANISMS ASSOCIATED WITH THEM

Paul R. Miller and Richard Weindling

This survey had as its purpose amplification of the data obtained last year in regard to prevalence and relative distribution of the organisms associated with boll rot. In general, the work was conducted along the same lines as previously, about the same methods being used in collecting the samples and in culturing and identifying the organisms. (PDR 23: 29-32. 1939).

Most of the samples consisted of 10 or more bolls. A piece of carpel about 1/2 x 1 cm. was cut from each of the 10 bolls, surface-sterilized for 5 minutes in 3 percent sodium hypochlorite solution, and transferred to Petri dishes containing water agar. The organisms growing out of these pieces were identified by microscopic examination in the plates. This method was supplemented by direct microscopic examination of spores appearing on the surface of boll lesions. Scrapings from bracts were made from all samples in which spores of Glomerella gossypii were not detected on the bolls. Bacteria were noted frequently on the water agar plates. From a few samples, bacteria which appeared to be B. malvacearum were isolated by dilution culture on potato dextrose agar plates.

The map (Fig. 2) indicates the extent of the survey by giving the number of the boll samples obtained from the counties in each State. Many individuals cooperated in collecting the bolls, including inspectors of the State Plant Board of Mississippi, who supplied samples covering practically all counties of that State.1/

A general summary of the results in respect to sample lots is given in Table 1. The left side of this table summarizes the results of the culture work. The right side gives the results on G. gossypii, obtained by plating and scraping. This summary confirms last year's evidence on the prevalence of this organism in 5 States, and extends it over the 11 cotton-growing States east of Texas and Oklahoma. The anthracnose organism was found in 82.3 percent of the fields sampled, or in 90.1 percent if Texas and Oklahoma are not considered. As in 1938, the other boll rot organisms occurring most frequently were Alternaria spp., Fusarium moniliforme, and other species of Fusarium.

1/ Some of the Mississippi samples arrived too late to be included in the summary tables. The results were, however, completely in line with those in this report.

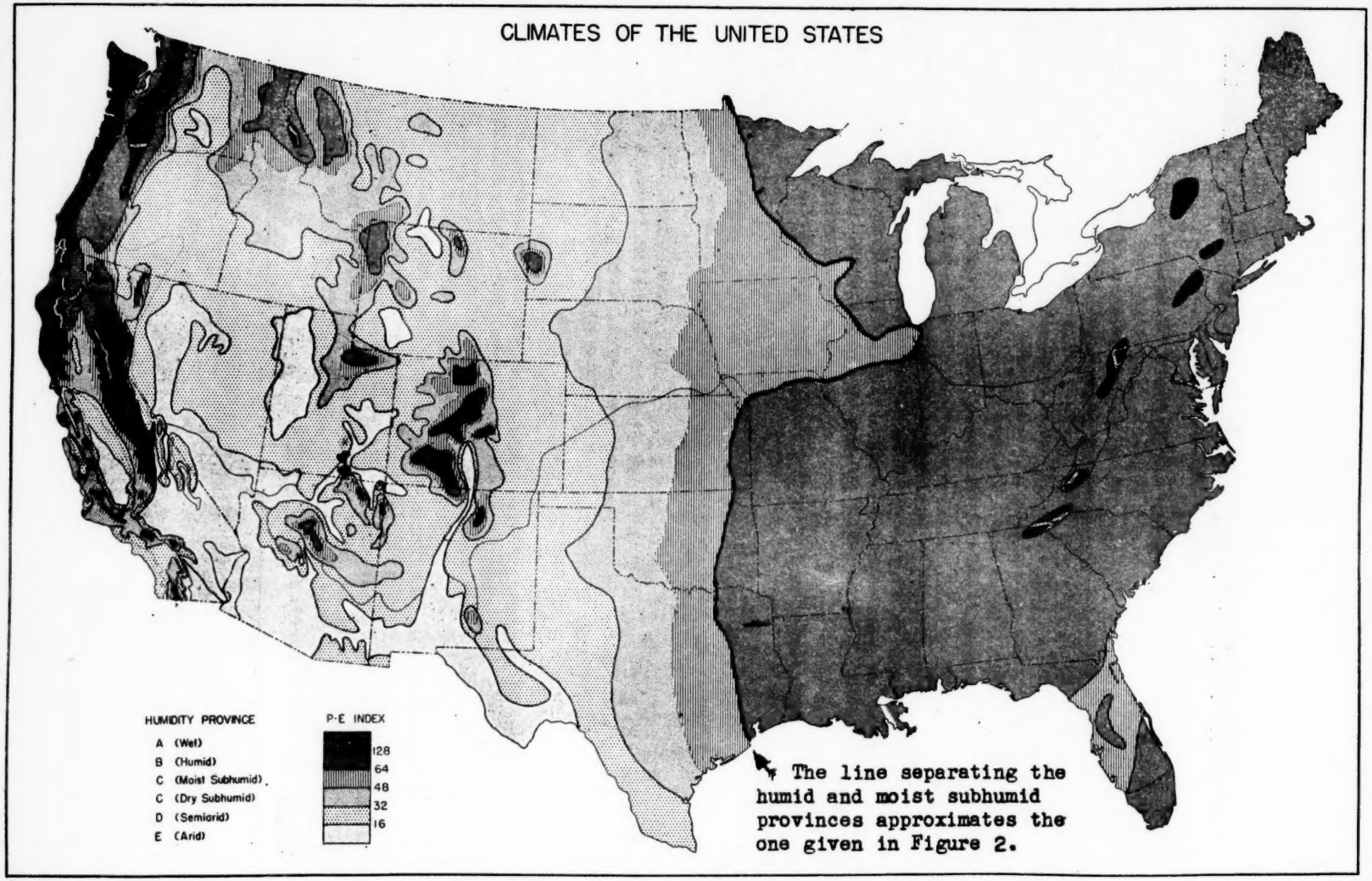

FIGURE 1.—Climates of the United States according to Thornthwaite's classification.

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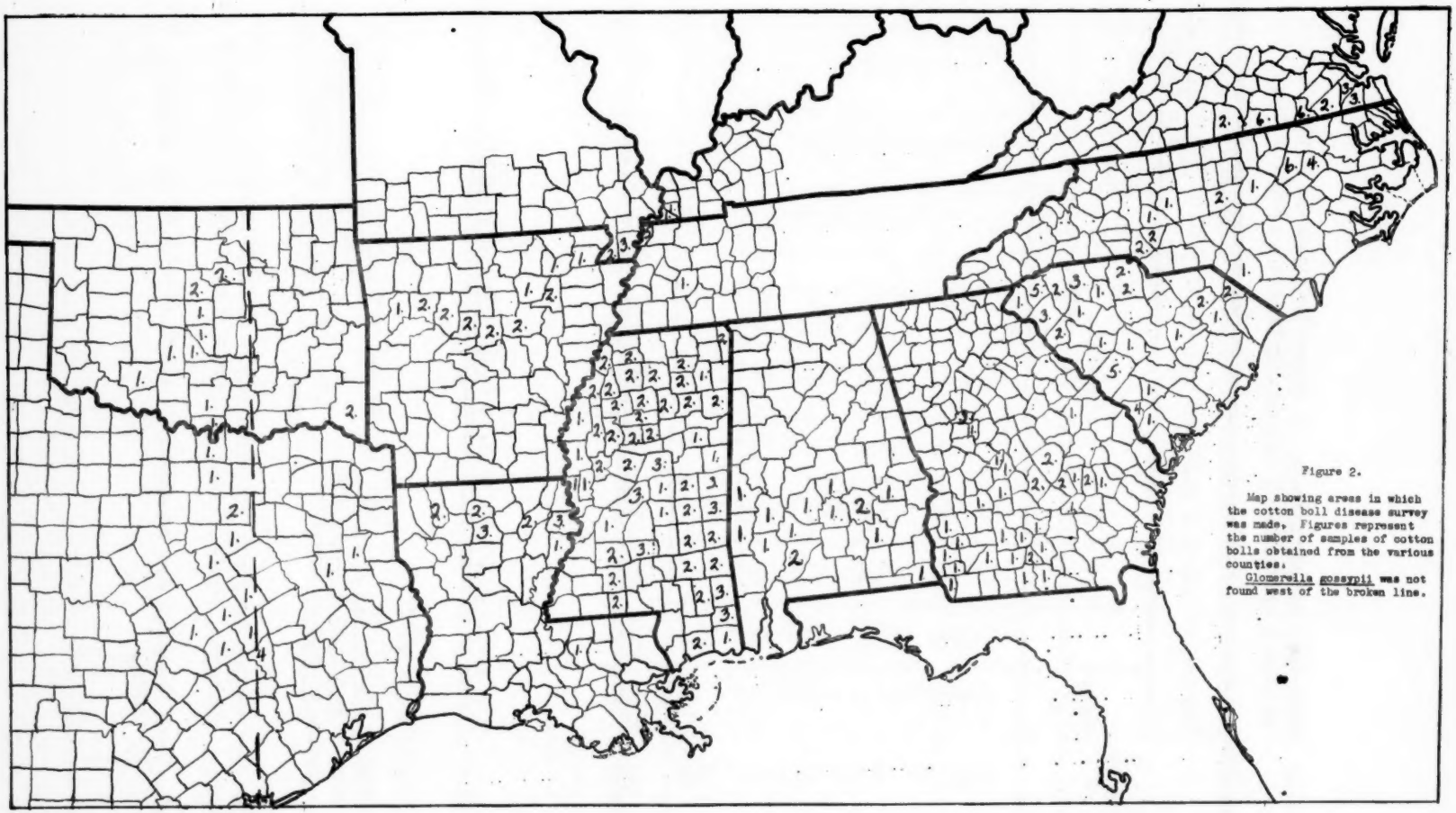

Figure 2.

Map showing areas in which the cotton boll disease survey was made. Figures represent the number of samples of cotton bolls obtained from the various counties.

Glomerella gossypii was not found west of the broken line.

Table 1. Frequency of occurrence of microorganisms on cotton bolls, expressed in terms of representation in sample lots.

State	Total number of samples	Number of samples cultured yielding: G.g. 1/	F.m.	A. spp.	F. spp.	D.g.	Others 2/	Bact.	Number of samples in which Glomerella gossypii was found: By culturing	By scraping: Bolls	By scraping: Bracts 3/	By culturing and scraping
Ala.	15	15	9	13	13	2	12	5	15	12		15
Ark.	16	5	14	16	9	4	10	11	5	7	2	11
Ga.	34	33	28	30	17	14	27	12	33	28	1	33
Ky.	2	2	1	2	2			1	2	1		2
La.	14	6	3	12	14	7	13	6	6	9	2	13
Miss.	95	80	75	81	84	15	66	18	80	72	4	86
Mo.	5	2	5	5	4		1	1	2	2	1	3
N.C.	20	19	17	19	12	3	12	10	19	20		20
Okla.	13	2	9	12	9	1	8	5	2	1	1	2
S.C.	41	32	27	41	22	9	30	22	32	27	1	37
Tenn.	6	3	2	6	5	1	4	3	3	3		3
Tex.	17		14	17	16	3	10	6		1	1	2
Va.	22	20	16	15	7	3	13	5	20	17	1	20
Total	300	219	220	269	214	62	206	105	219	200	14	247
Percentage of samples found with the different organisms -		73.0	73.3	89.7	71.3	20.7	68.7	35.0	73.0	66.7	4.7	82.3

1/ Abbreviations used:

G.g. = Glomerella gossypii
F.m. = Fusarium moniliforme
A. spp. = Alternaria species
F. spp. = Fusarium species other than F. moniliforme
D.g. = Diplodia gossypina
Bact. = Bacteria, not identified

2/ "Others" refers to fungi found rarely. They include species of Aspergillus, Rhizopus, Penicillium, Spicaria, and a few unidentified organisms.

3/ Only those samples are recorded in which spores of G. gossypii were not found on the bolls.

Table 2. Frequency of occurrence of microorganisms in cotton bolls found by plating, expressed in percentage.

State	Total number of bolls cultured	Percentage of bolls cultured showing: C.g.	F.m.	A. spp.	F. spp.	D.g.	Others	Bact.	Negative
Ala.	150	34.7	14.0	28.0	22.0	4.0	21.3	5.3	2.7
Ark.	157	3.8	15.9	75.8	10.8	3.2	11.5	22.9	1.3
Ga.	338	44.4	21.3	26.0	12.1	6.8	16.6	7.4	3.8
Ky.	20	45.0	10.0	50.0	15.0			5.0	
La.	138	5.1	2.9	20.3	64.5	8.7	16.7	8.0	
Miss.	950	33.2	24.6	32.6	25.2	2.0	14.9	3.5	1.1
Mo.	45	4.4	22.2	91.1	8.9		2.2	13.3	
N.C.	200	47.0	25.5	35.0	11.5	2.0	10.0	13.0	1.0
Okla.	118	1.7	18.6	63.6	22.0	.8	15.3	5.9	8.5
S.C.	410	30.2	14.6	52.0	8.0	2.9	14.1	18.0	2.0
Tenn.	55	25.5	9.1	58.2	27.3	3.6	10.9	21.8	
Tex.	166		21.7	75.3	28.3	1.8	9.6	9.6	
Va.	212	51.9	30.2	18.9	3.3	1.4	12.7	3.8	8.0
Total	2,959	28.9	20.5	40.3	19.5	3.0	14.1	8.9	2.2

Table 3. Frequency of occurrence of the spores of various fungi on cotton bolls as found by scraping.

State	Number of samples	Total number of bolls examined	Number of bolls found with: G.g.	F.m.	A. spp.	F. spp.	D.g.	Others	Negative
Ala.	15	56	32	3		21	8	2	1
Ark.	16	47	10	3	5	11			20
Ga.	34	155	116	4	1	29	11	2	9
Ky.	2	6	1		1	1			3
La.	14	80	21	3	1	65	2		3
Miss.	95	314	153	1	5	140	14	9	34
Mo.	5	15	3	2	1	4		1	4
N.C.	20	67	45		1	23		3	2
Okla.	13	39	3		4	17		9	7
S.C.	41	111	47	8	1	42		2	18
Tenn.	6	27	12		1	11		1	4
Tex.	17	89	1	2	15	55		10	16
Va.	22	51	38		1	16		2	1
Total	300	1,057	482	26	37	435	35	41	122
Percentage of bolls found with the different organisms -			45.6	2.5	3.5	41.2	3.3	3.9	11.5

Details of the findings as obtained on individual bolls are summarized in Table 2 and Table 3. Table 2 shows that the anthracnose organism was cultured from 29.9 percent of the 2959 bolls. It should be noted that G. gossypii was found on a much smaller percentage of individual bolls from Louisiana and Arkansas than from States further east (3.8 and 5.1 percent, respectively, as against 33.2 percent in Mississippi, 34.7 percent in Alabama, etc.), though Table 1 shows that the fungus was present in most of the sample lots from these 2 States. Table 3 supplements the evidence that in these 2 States a relatively small number of bolls carried the anthracnose organism.

Perhaps the most interesting feature of this survey is the wide distribution and the frequency of occurrence of anthracnose in the 11 cotton States east of Texas and Oklahoma and its apparent absence west of a line indicated in Figure 2. No such demarcation could have been made, based upon the observation of symptoms of the diseases as expressed on the cotton bolls in these regions. It would seem that Glomerella gossypii either usually occurs in the lesions caused by Bacterium malvacearum or else it also initiates green water-soaked spots indistinguishable from those caused by the bacteria.

As a possible explanation for the interesting distribution of anthracnose in 1939, it may be significant to note the apparent correlation of the general extent of the disease to that of the humidity provinces based upon precipitation effectiveness as given by Dr. C. W. Thornthwaite in Figure 1. For further explanation of this map see PDR Supplement 110: 171-173 and the references cited therein.

(Division of Mycology and Disease Survey and Division of Cotton and Other Fiber Crops and Diseases).

NUT DISEASES IN THE PACIFIC NORTHWEST IN 1939

P. W. Miller

PERSIAN WALNUT DISEASES

Walnut blight (caused by Phytomonas juglandis (Pierce) Bergey et al.): The season of 1939 was one of relatively light blight infection in the Pacific Northwest, the percentage of infected nuts varying, according to the locality, from 1 to 50. In Oregon, the most severe losses occurred in the Silverton district, where it is estimated that an average of about 25 percent of the crop in unsprayed orchards was lost from devastations of this malady. For the Pacific Northwest as a whole it is estimated that approximately 10 percent of the potential current walnut crop was destroyed.

Ring spot (caused by Ascochyta juglandis Bolt.): This disease occurred on the leaves of Persian walnuts in a number of orchards in the Willamette Valley in western Oregon. It was of little or no economic importance, however, as the lesions were not sufficiently abundant per leaf infected to cause any significant decrease in the functional leaf area.

Downy spot (caused by Microstroma juglandis (Bereng.) Sacc.): This disease was found in very limited amounts on leaves of Persian walnuts in an orchard near Corvallis, Oregon. It was of no economic importance as it caused very little, if any, decrease in the functional leaf area and did not cause any premature defoliation.

Leaf scorch (non-parasitic): This disorder was exceptionally severe and widely distributed in the Pacific Northwest in 1939, causing a significant decrease in the functional leaf area and premature defoliation in many cases. In general, orchards on the heavier soil types were more severely affected than those on lighter soils.

"Freckle-spot" (non-parasitic): This leaf spot was very prevalent and widely distributed in the Pacific Northwest in 1939, but was not of any great importance as it caused only a limited decrease in the functional leaf area, with no premature defoliation.

Sunscald: The abnormally high temperatures occurring in the Pacific Northwest during the summer of 1939, when the nuts were in a critical stage of development, caused severe damage to the crop in many instances. In some badly affected orchards it is conservatively estimated that about 10 percent of the nuts were destroyed by the injurious effects of the heat. Moreover, the quality of a relatively large percentage of the crop which was not killed outright was adversely affected, the kernels being partially shriveled and the seed coats an amber or brown color. In general, those orchards located on relatively shallow soil with a low supply of moisture were more severely affected than orchards located on deep soils with a large reserve of moisture.

The "black-line" disorder (non-parasitic): This disorder, characterized by a girdling of the bark at the union of black walnut rootstock and the Persian walnut top, caused the death of a relatively large number of grafted walnut trees in Oregon during 1939. The trees affected were Persian walnuts of the Vrooman Franquette variety grafted on California black walnut rootstocks. Trees succumbing ranged from 12 to 24 years of age. This disorder has never been found on Franquettes topworked or grafted on Persian walnut rootstocks.

FILBERT DISEASES

Bacterial blight (caused by Phytomonas sp.): This disease was generally not so prevalent nor so severe in the Pacific Northwest as in 1938. Tree losses in young orchards, 2 to 4 years of age, ranged from less than 1

up to 30 percent, the estimated average loss being about 5 percent. Although bacterial blight killed but very few trees over 5 years of age, it did destroy many potential pistillate-flower buds, nut-bearing twigs, and branches in older bearing orchards, thereby indirectly reducing the crop. In certain badly infected bearing filbert orchards in the Willamette Valley it is estimated that bacterial blight caused an indirect loss of from 25 to 50 percent of the crop. However, for the Pacific Northwest as a whole the loss from this cause is estimated at not to exceed 10 percent of the current crop of nuts.

Mildew (caused by Phyllactinia corylea (Pers.) Karst.): Filbert mildew was quite prevalent in certain localities in western Oregon during the late summer of 1939. The disease was apparently of only minor economic importance, however, as the infected leaves retained their normal green color and persisted on the trees up to the time of normal leaf fall. It is thought that the lateness of the attack may possibly be responsible for the apparent small amount of injury.

Leaf scald (non-parasitic): This disorder was exceptionally severe and widely distributed in the Pacific Northwest in 1939. In general, orchards located on relatively shallow soils with a low supply of moisture were more severely affected than plantings located on deep soils with a large reserve of moisture. Leaf scald was of considerable economic importance as it caused an appreciable decrease in the functional leaf area and in some cases a premature shedding of the leaves.

Brown-stain (non-parasitic): This disorder, which is typically characterized by the appearance of a brownish liquid at localized areas in the shell and by abortion of the embryo, was more prevalent in Oregon than at any time since 1931. Crop losses from this disorder ranged from less than 1 up to 35 percent, the estimated average loss being about 10 percent.

"Blanks" (non-parasitic): This disorder, which causes an abortion of the embryo, was present in greater amounts than usual in 1939. It was found in practically all filbert orchards visited during the year. Crop losses from this disorder varied from 5 to 40 percent, the estimated average being about 15 percent.

Sunscald: Sunscald due to the prevalence of abnormally high temperatures during the summer months caused the death of a relatively large number of young filbert trees from 1 to 3 years of age. The loss was particularly severe in young orchards where no attempt was made to shade the tender bark by trunk protectors.

Drought injury: The prolonged drought which occurred in the Pacific Northwest during the spring and summer caused the devitalization and death of a large number of young trees 1 to 2 years of age. This was especially

true in the case of late spring (1939) plantings and in orchards where the soil moisture was marginal.

(Division of Fruit and Vegetable Crops and Diseases).

DIPLODIA STALK ROT AND BACTERIAL WILT AGAIN PREVALENT IN ILLINOIS FIELD CORN

Benjamin Koehler

Visits were made in September 1939 to 20 outlying corn experimental fields widely scattered in Illinois. Diplodia stalk rot was present to an unusual extent in every field. In general, Diplodia stalk rot caused sudden death to the plants starting in August and continuing through September much as it did in 1938. On one day the leaves of a plant would be alive and the next day they would be dead as though the entire stalk had been cut off. A few days later the leaves would change to straw color. The appearance of stalk rot and the dying of plants occurred approximately at the same time by calendar dates as in 1938 but the damage to yield was considerably less. One probable reason for this was the unusually early pollination that took place, and development of the ears ahead of a normal season.

Dry warm weather no doubt hastened dying from stalk rot. Pycnidia of Diplodia developed abundantly on dead stalks in a few fields, but for the most part, although the rot was typical for Diplodia, pycnidia have developed only sparsely so far. This apparently was due to the dry weather conditions favoring such rapid dessication of the stalks that pycnidial formation was checked. Great differences in extent of premature dying from Diplodia and breaking down of cornstalks were observed between various single and double crosses, and records were made in fields suitable for such data. In other fields the situation was complicated by premature dying from drouth.

Bacterial wilt (Aplanobacter stewarti) caused more damage to early sweet corn and to some dent corn early in the season than occurred in 1938, and leaf infection spread to nearly all corn plants across the width of the State in central and south-central Illinois, but for the most part leaf infection in field corn did not kill as much leaf surface as in 1938, and of the 20 experimental fields examined significant damage to the leaves occurred only in the field located in Moultrie County.

(Illinois Agricultural Experiment Station).